

Title: MONITORING AND MODELING APPROACHES TO ASSESS THE CONDITION OF CORAL COMMUNITIES WITHIN PATCH REEF HABITATS OF THE FLORIDA REEF TRACT.

Principal Investigator: Diego Lirman  
Marine Biology and Fisheries Division  
Rosenstiel School of Marine and Atmospheric Science  
University of Miami  
4600 Rickenbacker Causeway  
Miami, FL 33149  
305-421-4168  
[dlirman@rsmas.miami.edu](mailto:dlirman@rsmas.miami.edu)

Co-Investigator(s): James Hendee  
National Oceanic and Atmospheric Administration  
Atlantic Oceanographic and Meteorological Laboratory

Project Summary: In response to concerns over declining ecosystem health, the Comprehensive Everglades Restoration Plan (CERP) has been charged with the restoration, preservation, and protection of the South Florida ecosystem. One of the goals of the proposed restoration effort is to increase freshwater inputs from upland sources into Florida Bay and Biscayne Bay to recover estuarine conditions along near-shore environments (Davis and Ogden, 1994; Browder and Wanless, 2001). However, the proposed increase in freshwater flows into coastal habitats has raised concerns over the potential impacts of changes in water quality on the reef communities of the Florida Reef Tract (see Porter and Porter, 2001 and references therein). Considering the location of Florida reefs downstream of a coastal landscape to be affected by the Everglades restoration effort, it is crucial that we develop the tools to assess present-day condition, document future change patterns as restoration activities proceed, and explore the potential long-term impacts of the restoration activities and associated stressors.

The goal of the proposed research is to continue and expand a monitoring and modeling program of coral populations that was initiated in 2001 with funding from the National Undersea Research Center (NURC). The activities of this project, based on random surveys of coral population size-structure and the repeated sampling of marked corals within permanent sites, would fill important information gaps identified by the sponsoring agencies of this rfp by:

- 1) Expanding research activities within patch-reef habitats under-represented in ongoing monitoring efforts and most likely to be affected, due to their location in nearshore, shallow areas, by changes in water quality associated with Everglades restoration

activities.

- 2) Documenting demographic data like coral population size-structure, recruitment, and colony-based parameters such as growth, partial, and total coral mortality in relation to environmental (e.g., distance to shore and connections to coastal bays) and resource protection (Special Protection Areas) gradients.
- 3) Providing the data required to develop and parameterize coral population models.

Relevance to  
Restoration and/or  
Resource  
Management:

The documentation of baseline population structure, coral growth and mortality patterns under present environmental conditions is required to assess changes in coral reef endpoints as environmental conditions change in response to human activities (e.g., Everglades restoration) or other disturbances such as disease outbreaks or increased temperature that increase stress levels of existing coral populations.

Geographic Area:

Florida Keys National Marine Sanctuary.